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FOREST PRODUCTS LABORATORY

In cooperation with the University of Wisconsin

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ECONOMIC AND SOCIAL IMPORTANCE OF A SUSTAINED SUPPLY OF RAW MATERIAL FOR THE WOOD-USING INDUSTRIES IN THE LAKE STATES

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OF RAW MATERIAL FOR THE WOOD-USING INDUSTRIES
IN THE LAKE STATES¹

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A good yard stick of the practical importance of an industry is the number of people that it supports, the value of the products that it manufactures, and the capital invested in it. An examination of the lumber and timber products industries of the Lake States from this point of view reveals that in 1929 more than 32,000 wage earners, probably representing a family responsibility of more than one hundred thousand people, are dependent on these industries for a livelihood and would have to seek jobs elsewhere if the supply of raw material should play out. Furthermore, under such a situation products worth nearly one hundred million dollars would no longer be manufactured, and the opportunity of amortizing a capital investment of perhaps 40 to 45 million dollars in plants would be pretty well wiped out. (See Table 1)

¹ Minnesota, Wisconsin, and Michigan.

² Maintained at Madison, Wisconsin, in cooperation with the University of Wisconsin.

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In addition there would be large additional losses due to the breaking up of communities and businesses dependent on the timber products industries. These enormous anticipated losses serve to emphasize the necessity of providing, in so far as is possible, by forest practice a permanent supply of raw material so that the sawmills, veneer plants, and the like, can continue to operate indefinitely thus sustaining themselves as well as the communities dependent upon them.

The same relative situation prevails in the pulp and paper industry and in addition the capital investment is much greater. Table 2 presents figures for this industry. Measured in terms of men employed the pulp and paper industry ranks about equally with lumber, pays nearly 10 million dollars more in wages, manufactures products worth 263 million dollars, or over 2-1/2 times that of the lumber industry, and has a capital investment roughly calculated at 140 million dollars as compared with approximately 42 million dollars in the lumber industry. Furthermore, it is much more difficult to move or salvage a pulp or paper mill than a sawmill. For all these reasons the pulp and paper industry is vitally concerned with the problem of providing a supply of raw material.

Together the lumber, timber products, and the pulp and paper industries have about one-quarter of a million people depending for a living upon the salaries and wages they pay out each year.

Requirements

The wood-consuming industries and the people in general also have a very definite interest in a local timber supply. The magnitude of this interest is clearly indicated by the fact that these plants in the Lake States have been using annually about 1-1/4 billion feet of hardwoods and nearly 1 billion feet of softwoods. An additional 1-2/3 billion feet of lumber has been used for rural and urban residential construction and for non-residential uses. Table 1 shows that roughly 4/5 of the softwood and 2/5 of the hardwood requirements are now being supplied by outstate lumber. While the competing regions are ready to meet increased demands, this is not necessarily advantageous to local concerns because the hardwoods of the Lake States are especially good for such uses as flooring, furniture, planing mill products, and specialties, and the price for shipped-in lumber may not remain favorable. Should the supply of local timber play out the regional industries and the general public might have to pay more for their lumber than they do now, because of the absence of local competition. Furthermore, the industries manufacturing products that require a wood with special properties, such as hard maple, might have difficulty in finding a satisfactory substitute.

In connection with use requirements it is worth while to consider the Lake States species and see if some of them

have special properties which make their perpetuation especially desirable not only to the Lake States but to the United States. Generally, white pine has been thought of as typifying the ideal species of the region, with sugar maple as a close second. Of the other important regional hardwoods, yellow birch is, of course, an excellent wood for many purposes, among which are furniture and interior trim. Rock elm is eagerly sought for special uses, because of its bending and shock resisting qualities. Basswood, beech, and ash are also good woods, but none compare with hard maple as a universally acceptable wood for general industrial uses and for specialty uses. Approximately 1,600 uses or recognized parts are supplied by sugar maple as compared with 1,200 for ash, and 800 for yellow birch. Maple is a lively competitor with other woods in such major fields as furniture, flooring, motor vehicles, and boxes and crates, and it practically dominates the market for specialty uses like boot and shoe findings, bearings, machine parts, and professional instruments.

Sugar maple is unique among woods because in it are combined a pleasing appearance, high and uniform resistance to wear, strength and smoothness, and satisfactory working and finishing qualities. From a forestry standpoint the important thing to consider is that at present the Nation depends upon the Lake States to supply at least 2/3 of the total amount of sugar maple that is used.

1. The first part of the paper is devoted to a general introduction of the subject and to a brief review of the previous work in this field.

2. In the second part, we shall consider the case of a single particle and shall show that the results obtained in this case are in agreement with the experimental data.

3. The third part of the paper is devoted to a study of the case of a system of two particles. We shall show that the results obtained in this case are in agreement with the experimental data.

4. In the fourth part, we shall consider the case of a system of three particles. We shall show that the results obtained in this case are in agreement with the experimental data.

5. The fifth part of the paper is devoted to a study of the case of a system of four particles. We shall show that the results obtained in this case are in agreement with the experimental data.

6. In the sixth part, we shall consider the case of a system of five particles. We shall show that the results obtained in this case are in agreement with the experimental data.

7. The seventh part of the paper is devoted to a study of the case of a system of six particles. We shall show that the results obtained in this case are in agreement with the experimental data.

In the pulp and paper field, spruce, the premier of pulpwood species, grows readily in the Lake States as do also jack pine, hemlock, and balsam fir. Nevertheless, for the Lake States region as a whole, about 1/5 of the pulpwood is imported, Michigan and Minnesota importing about 1/3 of their pulpwood requirements, and Wisconsin about 1/9. This occurs not because the required species of wood will not grow in the region, but because it is not available.

Markets

So far, it has been assumed that the only thing standing in the way of permanent industries in the Lake States is a sustained supply of raw material, but there is another requirement, perhaps even more important, and that is the ability to hold, recapture, and if possible expand the markets for timber products. One glance at the trend curve of wood consumption will convince anyone of the necessity for such efforts. To accomplish this, work along at least four lines is necessary: First, a lowering of costs to the consumer, second, an increase in satisfaction in the use of the products through improvement of properties and qualities, third, the development of new products or modified products, and fourth, the promotion of popular acceptance and use of the products by all legitimate means.

Such a program involves both industrial and public participation and a mutual responsibility. On the part of the

industry it is a problem of efficiency in production and distribution; on the part of the public it is one of protecting the long time public interest in forest land values through basic research and the development of products, especially those that industry cannot be expected to be interested in for the immediate future. For both, it is a job of developing interest and support from all sources so that forestry may be an economic success. Upon the successful marketing of the products of the forest depends not only the economic solvency of the industry but forest practice itself. To hold markets requires the most up-to-date merchandising methods and a product that gives satisfaction. Industry is mostly responsible for the first, while research mostly carried on by the public should point the way to meeting the second requirement.

Forest Land and Community Planning

The job logically may be divided into two parts:

(1) How should our present stands of timber be managed and what adjustment in plant capacity and community relocation is possible and desirable, and (2) how much of the job of providing for our own as well as National timber requirements should be assumed by the Lake States in a long time plan of land management.

Silvicultural research has progressed far enough to handle the first point for the present, but the industrial side

of the question has not been developed far enough to formulate an equitable plan. As a first step, the plants in the region should be surveyed to obtain information upon which to base a plant adjustment policy and plan. This could well be made a job for the employment of emergency funds. It is well known that the supply of timber is so limited in the Lake States that a sharp reduction in lumber producing plants is imminent no matter what is done in forest practice, but which plants or which types of producing units, considering the best interests of the region as a whole, should be encouraged and which ones discouraged, that is the question. The survey might include also the pulp and paper plants even though, as pointed out previously, it is more difficult to shift and salvage these plants than sawmills.

Based on the Copeland report (U.S. Senate Doc. 12, 73d Congress) figures and measured in cubic feet the Lake States region is growing about 8.3 percent of our estimated long time wood requirements on 11.3 percent of the commercial forest land. Considering the relative rates of growth in the various regions and the condition of the forested areas this looks as though the Lake States were doing pretty well; but not well enough, for an analysis of the growth shows that too much of it is made up of secondary species, such as aspen. Furthermore, an aggressive regional policy would seem to dictate an attempt to grow more than is needed locally because being close to markets and having good transportation it should be possible to operate in nearby competitive markets, particularly in the sale of the more valuable species that grow in the Lake States.

Table No. 1--Lumber and Timber Products Industries¹

Year	Production : : Soft-: Hard-: : woods: woods:	Lumber Used in : : Manufacture : : Soft- : Hard- : : woods : woods :	Percentage in : : shipped in : : Soft-: Hard- : : woods: woods:	Number of Establish- : : ments :	Number of Employees : : :	Wages and : : Salaries: Product:	Value of : : of : Invested ²
							Million Dollars
Michigan:							
1928:	---	---	---	93	46		
1929:	122	448	---	---	---	15.5	39.1
1933:	43	117	---	89	47		14.3
Minnesota:							
1928:	---	---	---	80	66		
1929:	306	51	---	---	---	5.2	14.7
1933:	38	11	---	61	32		8.9
Wisconsin:							
1928:	---	---	---	70	26		
1929:	354	489	---	---	---	16.2	44.9
1933:	74	112	---	76	33		21.1
Total Lake States:							
1928:	---	---	---	86	41		
1929:	782	988	---	---	---	36.9	98.7
1933:	155	240	---	76	33		44.3

1 From census data.

2 Rough calculations.

Table No. 2--Pulp and Paper¹

	Pulpwood Consumption	Percentage of	Number of	Number of	Wages and	Value of	Invested
	in 1000 cords	Imported	Establishments	Employees	Salaries	Product	Capital
Total	Domestic	Imported					
							Million Dollars
Michigan:							
1929:	313			13572	21.7	106	49.2
1931:	251	33	53	10797	---	---	---
		28	49				
Minne-							
sota							
1929:	266			2811	4.1	28	23.4
1931:	198	41	13	1872	---	---	---
		36	14				
Wiscon-							
sin							
1929:	1234			14493	20.8	129	66.7
1931:	957	11	79	12403	---	---	---
		13	72				
Total							
Lake							
States							
1929:	1813			30866	46.6	263	139.3
1931:	1406	19	145	25072	---	---	---
		19	135				

¹ From census data.

² Rough calculations.

